



Marshall Space Flight Center

Presentation to Google



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Marshall's Core Capabilities and Services



Space Transportation & Launch Systems



Propulsion Systems



Space Systems



Scientific Research

Exploration Vehicle Development



Space Launch System

- Program Management
- Stages
- Avionics
- Spacecraft & Payload Integration
- Advanced Development
- Boosters
- Engines

Orion

- Launch Abort System Motor Support

Technology Advancement



Advanced Exploration

- Nuclear Cryogenic Propulsion Stage
- Liquid Propulsion Systems

Space Technology

- Composite Cryogenic Propellant Tank
- Cryogenic Propellant Transfer/Storage

Industry & Defense Partnerships

Defense

- NIRPS
- SWORDs

Industry

- COTS Program & Partnerships
- CCDEV Program & Partnerships



National Institute for
Rocket Propulsion Systems

Low-Earth Orbit



International Space Station

- Payload Ops Integration Center
- Payload Ops Integration Function
- Multi-use Payloads
- Materials Science Research Rack
- Microgravity Science Glovebox
- Environmental Control/Life Support
- ISERV
- Advanced Manufacturing Technology Demonstrations

Future Exploration



Life Support

- Atmosphere Resource Recovery
- Next-generation Life Support

Destination Systems

- Mighty Eagle
- Lunar Mapping & Modeling
- Autonomous Systems
- Nuclear Systems



Technology Demo

- Technology Demonstration Missions
- Centennial Challenges



Astrophysics

Programs

- Chandra



Instruments

- HOPE/HEROES
- Fermi/GBM
- SRG/ART-XC (with Russia)

Research/Technology

- Advance Mirror Technology Demo

Test

- James Webb Mirror & COCOA Test

Heliophysics

Instruments

- Hinode/XRT
- Solar Probe Plus/SWEAP
- SUMI, Hi-C Suborbital



Earth Science

Instruments

- ISERV
- HIRAD
- LIS
- AMPR
- MAPIR

Selected Projects

- SPoRT
- SERVIR
- ACE
- Public Health
- Climate Dynamics



Planetary Science

Programs

- Discovery & New Frontiers



STO Organizational Structure

Mission: *Apply Marshall's unique capabilities to advance scientific understanding, knowledge application, and technical innovation, thus enabling a robust space economy and transformative exploration for the nation.*

Vision: *Marshall's Science and Technology organization will be a pre-eminent choice for delivering scientific and technical solutions as we reach for new heights and reveal the unknown for the benefit of humankind.*

Key Disciplines:



Astrophysics

Earth

Heliophysics

Planetary

Technology
Development
& Transfer

Earth Science Instruments



HIRAD (Hurricane Imaging Radiometer)

Flown on a WB-57 for the Hurricane & Severe Storm Sentinel (HS3) mission



AMPR (Advanced Microwave Precipitation Radiometer)

Flown on Earth Observing System (EOS) PM-1 platform



ISERV (SERVIR Environmental Research and Visualization System)

Installed on ISS in 2012



Scheduled to be installed on ISS in 2015



LIS (Lightning Imaging Sensor)

NOTE: Other lightning instruments include TRMM LIS and LIP (Lightning Instrument Package)

MAPIR (Marshall Airborne Polarimetric Imaging Radiometer)



Flown on multiple airborne suborbital platforms, and in partnership with U of Tennessee.

Earth Science Project Areas

SERVIR

Uses a broad array of Earth-based satellite observations



Climate



Disasters



Health



Agriculture

Climate Dynamics

Advances understanding of climate variability on intra-seasonal (20–90 day) to near-decadal scales. Improves NASA climate model performance in quantifying and predicting these variations.

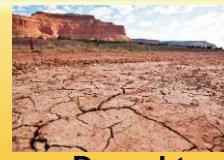


SPoRT (Short-term Prediction Research and Transition Center)

Uses multiple Earth-based satellite observations



Hurricanes



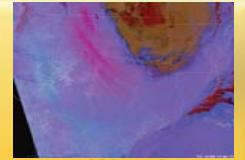
Drought



Tornadoes



Soil Moisture



Weather

Public Health and Air Quality Programs

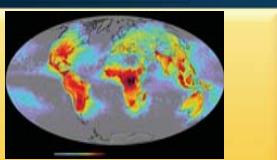
Uses data modeling and Earth-based satellite observations



Air Quality



Disease Vectors



Lightning NO_x

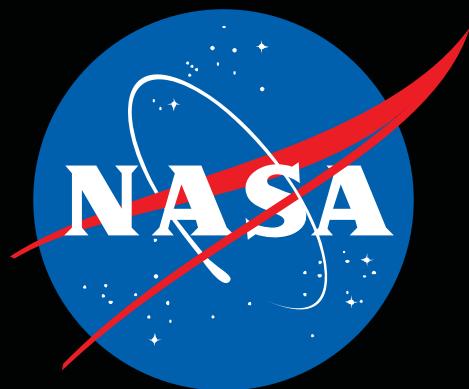
ACE (Arctic Collaborative Environment)

International partnership for information sharing to meet the challenges facing the Arctic



Working Together To Achieve
Greater Societal Benefits.





www.nasa.gov_marshall